UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 36511

CSAH NO. 15

OVER THE

BATTLE RIVER

DISTRICT 1 - KOOCHICHING COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512(CEI 23)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 36511, the North and South Abutments, were found to be in good to satisfactory condition with random cracking at the timber piles and backwall planking, but with no defects of structural significance. The channel bottom appeared stable with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) There was a 1/2 inch wide split near the top of the pile on the east side of the North Abutment. There was also a 2 inch wide by 3 foot long gap observed in the North Abutment backwall planking with evidence of the early stages of fill escaping. There was also a gap at the base of the North Abutment backwall with 6 inches of penetration back behind the wall.

(B) The corner timber pile on the East Wingwall of the North Abutment had a horizontal area of section loss across the pile width at the waterline.

(C) Although beyond the scope of the underwater inspection, a hole with an underlying cavity was found in the roadway pavement just behind the North Abutment. County Officials were immediately notified.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 36511

Feature Crossed: The Battle River

Feature Carried: CSAH No. 15

Location: District 1 - Koochiching County

Bridge Description: The superstructure is a single span multiple timber beam bridge. The superstructure is supported on two timber pile bent abutments. The abutments provide lateral support to the embankment fill with timber plank breastwalls, and skewed timber pile and plank wingwalls.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matthew J. Lengyel

Date: August 24, 2002

Weather Conditions: Sunny, ± 70^{o} F

Underwater Visibility: ± 1.0 Foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutments.

General Shape: Vertical breastwall flanked by wingwalls flared at approximately 45 degrees back from the breastwall. Wingwall tapers vertically to match roadway fill slopes. Nine piles in front of each breastwall, and two piles at each wingwall.

Maximum Water Depth at Substructure Inspected: Approximately 2.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pile cap at the east end of the South Abutment.

Water Surface: The waterline was approximately 6.8 feet below reference.
Assumed Waterline Elevation = 93.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

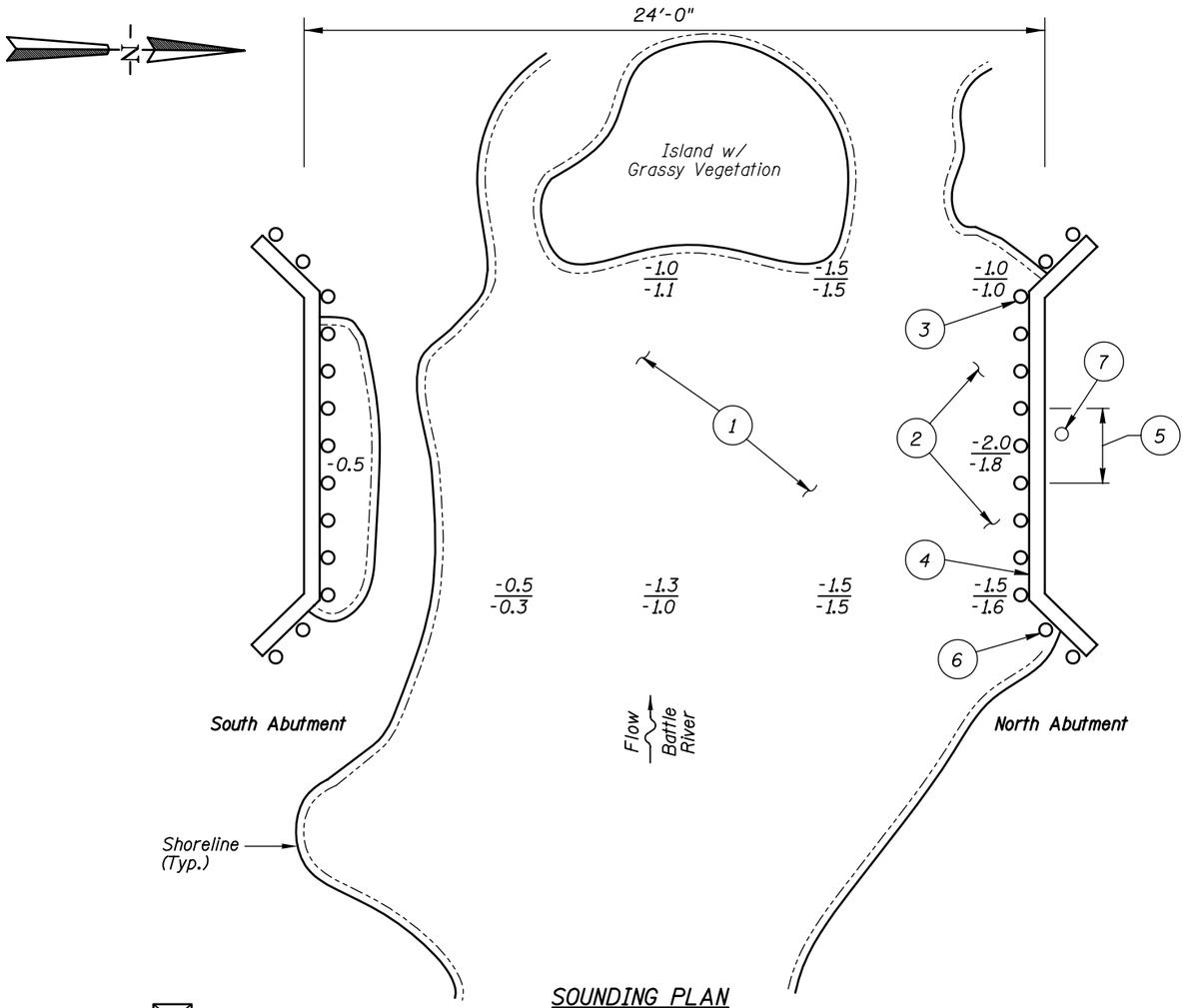
Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/08/02

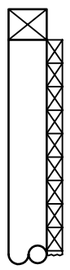
Item 113: Scour Critical Bridges: Code R/95

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF NORTH ABUTMENT

GENERAL NOTES:

1. The North and South Abutments were inspected underwater.
2. At the time of inspection on August 24, 2002, the waterline was located approximately 6.8 feet below the top of pier cap at east end of the South Abutment. Design plans were not available, therefore a reference elevation of 100.00 was assumed. Based on the assumed reference the waterline elevation was 93.2.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 and mid-points between the abutments.
5. Random checking up to 1/8 inch wide was observed on all of the timber piles.

INSPECTION NOTES:

(1) The channel material consisted of silty clay and sand with up to 1.5 feet of probe rod penetration.

(2) The channel bottom material at the North Abutment consisted of soft silt over firm clay and gravel.

(3) Split in pile, at the top 3 feet of the pile, 1/2 inch wide with 2 inches of penetration.

(4) Wood splintered off breastwall plank at the waterline, 2 inches wide by 3 feet long, with 6 inches of penetration. There appeared to be some gravel from behind the breastwall escaping.

(5) The bottom of the wall planking was observed 2 feet below the waterline with undermining and 6 inches of probe rod penetration into the backfill.

(6) The timber pile exhibited loss of section and was decayed at the waterline. Overall, half of the pile was separated but it was still plumb and stable.

(7) A 5 inch diameter hole with underlying cavity in the pavement behind the North Abutment.

Legend

-2.0 / -5.2 — Sounding Depth from Waterline (8/24/02) / Sounding Depth from Waterline (8/20/97)

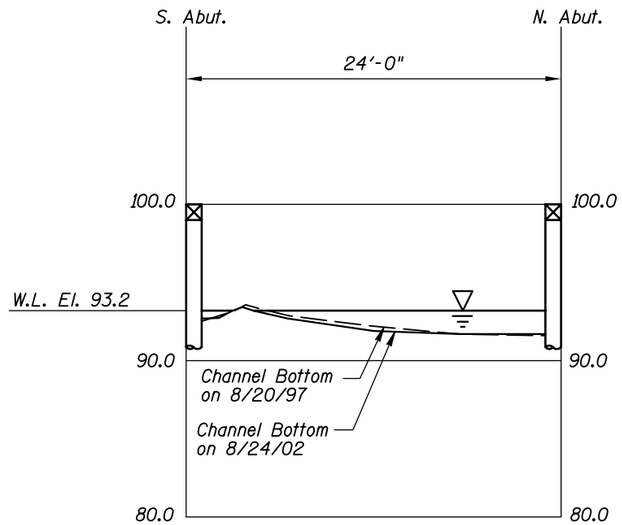
○ — Timber Pile

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

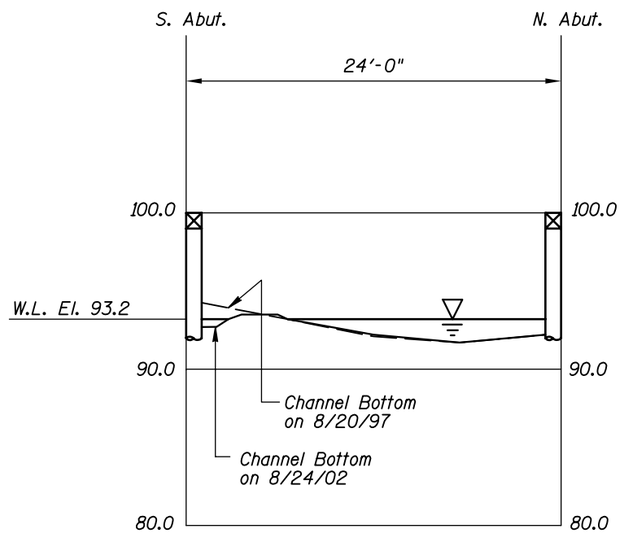
STRUCTURE NO. 36511
OVER THE BATTLE RIVER
DISTRICT 1, KOOCHICHING COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120023		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 3651I
OVER THE BATTLE RIVER
DISTRICT I, KOOCHICHING COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS (U.O.N.)
Code: 35120023		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Northeast.

Photograph 2. View of the North Abutment, Looking Northeast.

Photograph 3. View of the South Abutment, Looking Southeast.

Photograph 4. View of the Pile Section Loss at the East Wingwall of the North Abutment, Looking North.

Photograph 5. View of hole in Pavement behind the North Abutment, Looking North.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 24, 2002

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 36511 WEATHER: Mostly Cloudy, "70° F

WATERWAY CROSSED: Battle River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR

X OTHER Wading only due to minimal water depths

PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel

EQUIPMENT: U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 11:00 A.M.

TIME OUT OF WATER: 11:40 A.M.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY "1.0 feet

DEPTH 2.0 feet maximum at the North Abutment

ELEMENTS INSPECTED: North and South Abutments

REMARKS: Overall, the timber piles and timber planking of the abutment backwalls and wingwalls were in good to satisfactory condition with random checking or cracking up to 1/8 inch wide. One timber pile on the northeast wingwall exhibited an area of section loss, with decay, separating the pile halfway through at the waterline. One pile at the North Abutment exhibited a 1/2 inch split near the top of the pile, and a 2 inch wide by 3 feet long gap with 6 inch of penetration was present in the North Abutment backwall with a slight amount of fill beginning to escape. Also, near the center of the North Abutment, the bottom of the wall planking was exposed with undermining 2 feet below the waterline with 6 inches of penetration into the gravel backfill behind the abutment.

FURTHER ACTION NEEDED: _____ YES __X_____ NO

Monitor the pile with the section loss at the North East Abutment, if further decay/deterioration continues, replacement may be warranted.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

Note: Inspection can be accomplished with waders by general inspection during a period of low water levels.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 36511
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Battle River

INSPECTION DATE August 24,2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	South Abutment	0.5’	7	7	N	9	N	7	8	N	N	8	8	N	N	7	7	N	N
	North Abutment	2.0’	6	6	N	9	N	6	8	N	N	8	8	N	N	6	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the timber piles and timber planking of the abutment backwalls and wingwalls were in good to satisfactory condition with random checking or cracking up to 1/8 inch wide. One timber pile on the northeast wingwall exhibited an area of section loss, with decay, separating the pile halfway through at the waterline. One pile at the North Abutment exhibited a 1/2 inch split near the top of the pile, and a 2 inch wide by 3 feet long gap with 6 inch of penetration was present in the North Abutment backwall with a slight amount of fill beginning to escape. Also, near the center of the North Abutment, the bottom of the wall planking was exposed with undermining 2 feet below the waterline with 6 inches of penetration into the gravel backfill behind the abutment.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.